paper. The same operation is repeated until a predetermined number of sheets are printed.

The capping operation is performed when no print signal is detected for a predetermined period of time. Head H is covered with cap **100** (FIG. **43**) to ensure that the ink at the nozzle tip of head H does not dry and that the nozzle does not clog.

In this case, carriage **610** enters second nonprint area A2. As shown by the solid lines in FIG. **48**, retainer **43***a* of locking lever **43** of changeover lever **40** is engaged in capping-position hole **614** in the carriage, so that actuating lever **42** rotates clockwise. For this reason, even if carriage **610** enters second nonprint area A2, second distal end portion **42***b* of the actuating lever **42** does not abut against projection **34** at the tip of the actuating piece, and passes below projection **34**, as shown in FIG. **49**. Accordingly, actuating piece **30** maintains an upright state as indicated by the solid lines in FIG. **48**, so that drive gear **20** remains engaged with paper-feeding-mechanism driving gear **22**.

In this way, the capping operation is performed and drive gear **20** will rotate so the paper feeding operation is performed.

Subsequently, when a print signal is detected, the carriage returns to print area PA to perform the printing operation.

When the nozzle of head H becomes clogged, it is necessary to eliminate the clogging by forcibly sucking the ink from the nozzle by using a suction mechanism. The suction operation is performed by manually throwing a switch which may be on the operation panel or the like of the printer. When the switch is in the ON position, carriage **610** first enters deeply into the first nonprint area A1. Then, as indicated by the phantom lines in FIG. **52**, first distal end portion **42***a* of actuating lever **42** contacts selecting protrusion F5, and changeover lever **40** rotates counterclockwise against the force of spring **44** (FIG. **54**). Inclined surface **43***c* of retainer **43***a* at the distal end portion of locking lever **43** contacts with an upper side **614***[a]* (see FIG. **48**) of capping-position hole **614**, and retainer **43***a* disengages from capping-position hole **614** while locking lever **43** is deflected in the direction indicated by arrow a in FIGS. **50** and **54**. Selecting protrusion F5 still forcing changeover lever **40** to rotate against the spring force of spring **44** causes retainer **43***a* to engage suction-position hole **615**. When retainer **43***a* reaches suction-position hole **615**, retainer **43***a* rotates in the direction of arrow b (FIG. **50**) by the resiliency of locking lever **43**, and engages suction-position hole **615**. Changeover lever **40** is now set in the suction position.

Subsequently, carriage **610** passes print area PA and enters second nonprint area A2. Then, as indicated by phantom lines in FIG. **48** and **51**, second distal end portion **42***b* of actuating lever **42** contacts projection **34** at the tip of actuating piece, thereby flexing actuating piece **30** clockwise (in FIG. **48**). As actuating piece **30** flexes, ring portion **32** of actuating piece **30** contacts intermediate-diameter portion **20***b* of drive gear **20**, causing drive gear **20** to slide in the direction of arrow y (as indicated by the phantom lines) and engage suction-mechanism driving gear **23**. Furthermore, since actuating piece **30** is resilient (i.e. a leaf spring), the positional variation of carriage **610** is absorbed, and drive gear **20** engages smoothly with suction-mechanism driving gear **23**.

The suction mechanism can now perform the suction operation.

If a print signal is subsequently detected, the carriage returns to print area PA, and changeover lever **40** is reset in the following manner. When carriage **610** moves in the direction of arrow z (FIG. **48**), resetting projection **43***b* at the tip of locking lever **43** contacts with the rear surface of resetting protrusion F3, as indicated by the phantom lines in FIG. **49** and a broken-line arrow X1 in FIG. **55**. As shown in FIGS. **50** and **55**, since resetting protrusion F3 is at an angle with respect to the advancing direction of the carriage, locking lever **43** is deflected as indicated at arrow a and retainer **43***a* disengages from suction-position hole **615**. Then, changeover lever **40** rotates clockwise in FIG. **48** by the action of spring **44**, and retainer **43***a* enters capping-position hole **614**, as indicated by the solid lines of FIG. **48**. Resetting projection **43***b* also abuts against resetting protrusion F3 when carriage **610** enters the second nonprint area after changeover lever **40** is set in the suction position in first nonprint area A1, in this case resetting projection **43***b* abuts against the front surface of resetting protrusion F3, as indicated by arrow X2 in FIG. **55**, and retainer **43***a* acts in such a manner as to enter deeply into suction-position hole **615**. Hence, changeover lever **40** is prevented from becoming reset.

As described above and in accordance with the ink jet printer of this embodiment, carriage **610** is first entered into first nonprint area A1 to select the state of changeover lever **40** provided on the carriage, and carriage **610** is then entered into second nonprint area A2 to change over the position of drive gear **20** by means of changeover lever **40**. Thus, the paper feeding operation or the suction operation can be effected selectively.

Therefore, since the paper feeding operation and the suction operation are selectively performed, the drawback found in conventional mechanisms of the recording paper being fed when the suction operation is performed is eliminated. Furthermore, the drawback of the suction operation being performed despite the fact that the head is not clogged is eliminated. Moreover, since only one nonprint area is provided on each side of the print area, the width of the printer in the direction of the row can be reduced.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in carrying out the above method and in the constructions set forth without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. An ink jet printer comprising:

a printer case having a print area where printing upon a sheet is permitted and a nonprint area where printing upon a sheet is not permitted,

a carriage slideably mounted to said printer case so as to slide through said print area and said nonprint area of said printer case;

an ink cartridge mounted on said carriage;

a lever pivotably attached to said carriage for attaching and detaching the ink cartridge from said carriage, said lever being pivotable between an open position where the ink cartridge is detached from the carriage and a closed position where the ink cartridge is attached to the carriage; and

a lip attached to said printer case and positioned above said lever and within said print area for preventing said

lever from detachment of said ink cartridge when said carriage is positioned within said print area, and for abutting said lever to prevent said carriage from moving from said nonprint area to said print area when said lever is in the open position.

2. The ink jet printer as claimed in claim 1, wherein said lip extends substantially along the length of said print area and has a gap formed therein.

3. The ink jet printer as claimed in claim 1, wherein said lip is formed integrally with said printer case.

4. An ink jet printer comprising;

a carriage slideably mounted to said printer case so as to slide along a print area;

substantially U-shaped lever including a first arm having a first fixed end, a first free end and a first pivot point, a second arm having a second fixed end, a second free end and a second pivot point, and a tab connecting said first fixed end and said second fixed end, said lever being pivotably mounted to said carriage at said first pivot point and said second pivot point for pivoting about a pivoting axis defined as a line drawn between said first pivot point and said second pivot point; and

an ink cartridge detachably mounted to said carriage by said lever;

wherein, said lever being pivotable about the pivot axis between a first position where the lever engages an ink cartridge and a second position where the ink cartridge is attached to the carriage, and, wherein, pivoting of said lever between said first and second positions causes rotation displacement of the ink cartridge relative to said carriage.

5. The ink jet printer as claimed in claim 4, wherein said lever includes at least one resilient member for engaging said carriage when said lever is in the second position.

6. The ink jet printer as claimed in claim 4, further comprising a head mounted on said carriage having a connecting portion and wherein said carriage includes a mating portion for matingly engaging said connecting portion when said lever is in the second position.

7. The ink jet printer as claimed in claim 4, further comprising a needle attached to said head, and wherein said cartridge has an ink outlet and includes a seal for sealing said ink outlet, and said needle punctures said seal when said lever is in the second position to create fluid communication between said cartridge and said needle.

8. The ink jet printer of claim 4, wherein a discernible signal is produced by said lever when said lever is moved to the second position thereby signaling that the cartridge is in the attached position.

9. The ink jet printer of claim 4, wherein the pivoting axis is substantially parallel to the direction of the carriage movement.

10. The ink jet printer as claimed in claim 4, wherein said first arm includes a first resilient portion and said second arm includes a second resilient portion, said cartridge includes a first convex portion and a second convex portion formed thereon, and said first resilient portion engages said first convex portion and said second resilient portion engages said second convex portion to attach said ink cartridge to said carriage.

11. The ink jet printer as claimed in claim 10, wherein said first resilient portion has a first hole that engages said first convex portion of said ink cartridge and second resilient portion has a second hole that engages said second convex portion of said ink cartridge when said ink cartridge is in the attached position.

12. The ink jet printer as claimed in claim 4, comprising a first pin and a second pin attached to said ink cartridge on opposed sides of said cartridge so as to project outwardly from said sides said first arm having a first cam groove sized and shaped to accommodate said first pin and said second arm having a second groove sized and shaped to accommodate said second pin, said first and second cam grooves for guiding said cartridge to an attached position where said cartridge is attached to said carriage.

13. The ink jet printer as claimed in claim 12, wherein each of said first and second cam grooves has an opening exposed to accept said first and second pins when said lever is in the first position, said cam groove being shaped to guide said first and second pins and therefore said cartridge to the attached position when said lever is pivoted from the first position to the second position.

14. The ink jet printer as claimed in claim 12, wherein said first and second cam grooves each have an inside edge, said first and second cam grooves are shaped relative to said pivoting axis so that the distance between the inside edges of the grooves and said pivoting axis increases as said lever pivots from the first position to the second position to displace said cartridge toward said carriage to the attached position.

15. An ink jet printer, comprising:

a carriage which moves along a print area:

a head mounted on said carriage;

a U-shaped lever comprising first and second arms and a tab joining a first end of each arm, said lever being pivotably mounted on said carriage at a second end of at least one of said arms for pivoting about an axis extending between said second ends of said arms;

an ink cartridge mounted on said carriage at least in part by said lever; and

wherein each of said arms includes a resilient portion, said ink cartridge includes convex portions formed thereon, and each of said resilient portions engage a respective one of each of said convex portions to at least in part support said ink cartridge in said carriage moving direction.

16. The ink jet printer as claimed in claim 15, wherein said resilient portions have a hole that engages said convex portions of said ink cartridge when said ink cartridge is in said cartridge's mounted position.

17. An ink jet printer, comprising:

a carriage which moves along a print area;

a head mounted on said carriage;

a U-shaped lever comprising first and second arms and a tab joining a first end of each arm, said lever being pivotably mounted on said carriage at a second end of at least one of said arms for pivoting about an axis extending between said second ends of said arms; and

at least one of said arms including a resilient portion for engagement by said ink cartridge to support said ink cartridge in said ink cartridge on said carriage in a direction of movement of said carriage;

an ink cartridge mounted on said carriage at least in part by said lever, said ink cartridge being provided with a pair of pins projecting outwardly on opposed sides in said carriage moving direction, and each of said first and second arms includes a cam groove for receiving said pins for facilitating the mounting and demounting of the ink cartridge in said carriage.

18. The ink jet printer as claimed in claim 17, wherein each of said cam grooves has an opening exposed when said lever is in an open position, said cam grooves being shaped to guide said pins and therefore said cartridge to its mounted

position when said lever is pivoted from said open position to a closed position.

19. The ink jet printer as claimed in claim **18**, wherein said cam grooves are shaped relative to said axis of pivoting of said lever so that the distance between a point on the grooves and said axis of pivoting of said lever increases as said lever pivots from said open to said closed position to displace said cartridge toward said carriage to said cartridge's mounted position.

20. An ink jet printer, comprising:

a carriage which moves along a print area;

a head mounted on said carriage;

a U-shaped lever comprising first and second arms and a tab joining a first end of each arm, said lever being pivotably mounted on said carriage at a second end of at least one of said arms for pivoting about an axis extending between said second ends of said arms;

an ink cartridge mounted on said carriage at least in part by said lever; and

at least one of said arms including a resilient portion for engagement by said ink cartridge to support said ink cartridge in said ink cartridge on said carriage in a direction of movement of said carriage; said resilient portion assisting in reducing vibration of said carriage when said carriage is moving in said carriage moving direction.

21. An ink jet printer, comprising:

a printer case;

a carriage slideably mounted to said printer case;

an ink cartridge having a first side including a first pin extending outwardly from said first side, and a second side including a second pin extending outwardly from said second side, said ink cartridge being attached to said carriage; and

a lever having a first arm, a second arm, and a tab connecting said first arm to said second arm, said first arm having a first groove sized to accept the first pin and said second arm having a second groove sized to accept the second pin when said lever is at a first position.

22. The ink jet printer of claim **21**, wherein said first pin and said second pin move within said first and second grooves, respectively, to position said ink cartridge on said carriage as said lever pivots from the first position to a second position.

23. The ink jet printer of claim **21**, wherein the carriage includes a supporting portion and said lever includes a stopper pin positioned to contact said supporting portion when said lever is in the first position to prevent said lever from overpivoting.

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